

CLAIMS

What is claimed is:

- 1 1. A method for data flow control of a plurality of execution nodes of an
2 adaptive computing engine (ACE), the method comprising:
3 (a) associating a plurality of task parameters with a plurality of tasks within an
4 execution node;
5 (b) identifying readiness of a plurality of task resources based on a status of the
6 task parameters; and
7 (c) pacing allocation of the plurality of tasks to the execution node based on the
8 readiness the plurality of task resources.
9
10 2. The method of claim 1 wherein the execution node includes a reconfigurable
11 execution unit.
12
13 3. The method of claim 2 wherein the reconfigurable execution unit further
14 comprises one or more finite state machines.
15
16 4. The method of claim 1 wherein the task parameters identify, by designation,
17 an input port, an output port, a finite state machine, and a finite state machine instance.
18
19 5. The method of claim 4 wherein identifying a readiness step (b) further
20 comprises the step of (b1) identifying a task as an executable task when the input port is
21 available, the output port is available, and the finite state machine is idle.

1 6. The method of claim 1 further comprising the step of (d) aggregating
2 executable tasks in a queue.

1 7. The method of claim 6 wherein allocation pacing step (c) further comprises
2 the steps of (c1) reading a next executable task from the queue and (c2) generating a signal
3 to start execution in the finite state machine associated with the next executable task.

1 8. The method of claim 7 further comprising the steps (e) of reconfiguring the finite
2 state machine from one instance to another as necessary, reading data from the input port,
3 (f) processing the data in the finite state machine, and (g) writing the data to the output port.

1 9. The method of claim 8 further comprising the steps of (h) generating a signal
2 indicating completion of the execution in the finite state machine and (c) re-entering an idle
3 state in the finite state machine.

1 10. The method of claim 4 wherein the designation comprises a number.

1 11. A system for flow control in processing nodes of an adaptive computing
2 engine (ACE), the system comprising:

3 a reconfigurable execution unit; and

4 flow control logic coupled to the reconfigurable execution unit for associating tasks
5 and task parameters, identifying readiness of task resources based on a status of the task

6 parameters, and pacing allocation of the tasks to the reconfigurable execution unit based on
7 the readiness of task resources.

1 12. The system of claim 11 wherein the reconfigurable execution unit further
2 comprises one or more finite state machines.

1 13. The system of claim 11 wherein the task parameters identify, by designation,
2 an input port, an output port, a finite state machine, and a finite state machine instance.

1 14. The system of claim 13 wherein the designation comprises a number.

1 15. The system of claim 13 wherein the flow control logic further identifies a
2 task as an executable task when the input port is available, the output port is available, and
3 the finite state machine is idle.

1 16. The system of claim 12 further comprising a queue for aggregating
2 executable tasks.

1 17. The system of claim 16 wherein the flow control logic reads a next
2 executable task from the queue and generates a signal to start execution in the finite state
3 machine associated with the next executable task.

1 18. The system of claim 13 wherein the finite state machine reconfigures from
2 one instance to another, if necessary, reads data from the input port, processes the data, and
3 writes the data to the output port.

1 19. The system of claim 18 wherein the finite state machine further generates a
2 signal indicating completion of the execution and re-enters an idle state.

1 20. A system for flow control in processing nodes of an adaptive computing
2 engine (ACE), the system comprising:
3 a plurality of finite state machines, each finite state machine for performing a task;
4 control logic for determining task parameter status for the task and identifying the
5 task as executable; and
6 a task queue for storing executable tasks transferred by the control logic and issuing
7 the executable tasks to the plurality of finite state machines.

1 21. The system of claim 20 wherein the plurality of finite state machines form an
2 execution unit for a processing node within an adaptive computing engine.

1 22. The system of claim 20 wherein the control logic determines a status of an input
2 port, an output port, a finite state machine idle state, and an instance of the finite state
3 machine.

1 23. The system of claim 22 wherein the control logic identifies a task as
2 executable when the input port and output port are available and the finite state machine is
3 idle.